J. S., T. A., & E. R. WALKER'S COMPLETE SPECIFICATION. (1 SHEET)

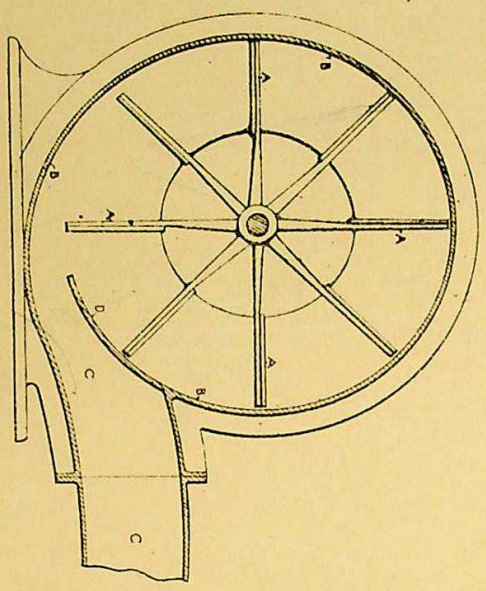

FIG. 1.

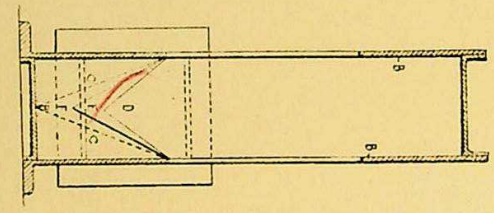

FIG. 2.

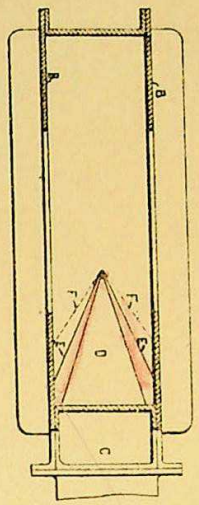

FIG. 3.

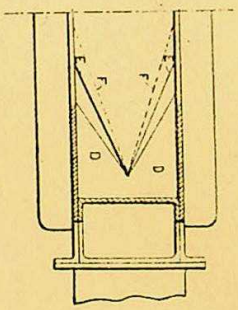

FIG. 4.

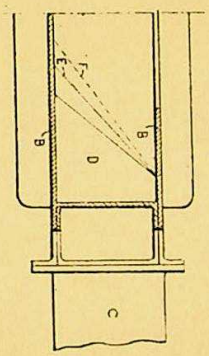

FIG. 5.

LONDON: Printed by EYRE and SPOTTISWOODE.
Printers to the Queen's most Excellent Majesty. 1885

Malby & Sons, Photo-Litho.

03 - PNEUMATICS,
AIR & GAS PUMPS,
Rotary.

A.D. 1885, 24th JANUARY. N° 1051.

PROVISIONAL SPECIFICATION.

Improvements in or Appertaining to Rotary Fans.

We JOHN SCARISBRICK WALKER THOMAS ASCROFT WALKER and EDWIN ROBERT WALKER all of Pagefield Iron Works Wigan in the County of Lancaster Mechanical and Mining Engineers, do hereby declare the nature of the said invention for "IMPROVEMENTS IN OR APPERTAINING TO ROTARY FANS" to be as follows:—

The object of this Invention is to reduce as far as possible the noise and vibration usually caused by rotary fans.

In most of these the air in its exit is driven against the edge of what is sometimes known as the shutter forming one side of the Chimney or Channel into which the air is delivered by the fan—The edge of this shutter is usually in a direction parallel with the shaft of the fan or face of the blades and it therefore receives the air from the vanes along the whole of its edge at once—Now we find that by so shaping the shutter that the air impinges gradually upon the whole surface as by making what we may call the "cutting edge" at an angle to the face of the fan blade, we can to a very large extent if not entirely get rid of the objectionable noise and vibration.

A single long incline or two inclines meeting at the centre, give good results but, it is evident that these forms may be considerably varied so long as the impact is gradual and not upon the whole "cutting edge" simultaneously.

We prefer to make the distance occupied by the incline or inclines slightly greater than the distance between two blades so that the following blade may be opposite the commencement of the incline before the blade next in advance of it has entirely left the incline.

We do not however tie ourselves to this Construction.

Where required wires, bars, gratings, or equivalent may be placed in the exit passage so as to divide or cut up the sound waves and in exhausting fans sometimes the exit orifice may be surmounted with a louvre roof.

Dated this 24th day of January 1885.

W. P. THOMPSON & BOULT,
Agents.

[*Price* 8*d*.]

COMPLETE SPECIFICATION.

Improvements in or Appertaining to Rotary Fans.

We, JOHN SCARISBRICK WALKER, THOMAS ASCROFT WALKER, and EDWIN ROBERT WALKER all of Pagefield Iron Works, Wigan, in the County of Lancaster, Mechanical and Mining Engineers do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of this invention is to reduce as far as possible the noise and vibration usually caused by rotary fans.

In most of these the air in its exit is driven against the edge of what is sometimes known as the shutter, forming one side of the chimney or channel into which the air is delivered by the fan. The edge of this shutter is usually in a direction parallel with the shaft of the fan or face of the blades the vane therefore instantly ceases to deliver the air into the chimney or outlet along the whole of its edge at once. Now we find that by so shaping the shutter that the air passing into the chimney or outlet is cut off gradually as by making what we may call the "cutting edge" at an angle to the face of the fan blade, we can to a very large extent, if not entirely, get rid of the objectionable noise and vibration.

A single long incline, or two inclines meeting at the centre, give good results, but it is evident that these forms may be considerably varied so long as the impact is gradual, and not upon the whole "cutting edge" simultaneously.

We prefer to make the distance occupied by the incline or inclines, somewhat greater than the distance between two blades so that the following blade may be opposite the commencement of the incline before the blade next in advance of it has entirely left the incline, but this length is variable according to the circumstances under which the fan works, and differs especially according to the load on the fan.

Referring to the drawings:—

Figure 1 is a longitudinal section of a fan and fan case.

Figure 2 vertical transverse section of same fan case.

Figure 3 horizontal section of same.

Figures 4 and 5 section similar to Figure 3 shewing two modifications.

In these A is the fan, B fan case, C outlet, D improved shutter. As already stated this shutter is required to be longer sometimes than others, we prefer therefore to make the edge of a series of segments E E bolted to the actual shutter by means of covering strips and bolts. There can either be kept change pieces to vary the size of the shutter, or third pieces F shown in dotted lines can be united to these in a similar manner. In Figures 2 and 3 the shutter is shown as adapted to a fan fed from each side, and in which the shutter is deepest in the centre. In Figure 4 it is shown for a similar case, but with the shutter concave instead of convex. Figure 5 shows another arrangement of a shutter. The fan may be fed with air from one or both sides.

We would further remark that while one slope as in Figure 5 or at most two slopes as in Figures 3 and 4 would be preferable there could be several sharper triangular teeth instead of one more obtuse one, or curves could be used instead of

straight lines, the main point required being to so arrange the shutter edge that the fan shall pass different parts of it at different times, and shall gradually pass it instead of passing any large part of it at the same instant.

It will be obvious that where no shutter is employed the orifice can be made with the edge that is met by the fan blades in their course formed at an oblique angle to the edges of the blades.

In the following claim we wish the word shutter to be understood as including this portion of the fan case orifice in those cases where there is little or no shutter proper.

Having now particularly described and ascertained the nature of our said Invention, and in what manner the same is to be performed, we declare that what we claim is

The construction of fan cases having that edge of the exit orifice or shutter, that is met by the fan blades in their rotation past said orifice or shutter, so formed that the fan blades in passing it shall gradually or by degrees cut off the communication between the air driven in front of any such fan blade, and the exit orifice, substantially as described.

Dated this 20th day of October 1885.

WM P. THOMPSON & Co.,
Of 6, Lord Street, Liverpool, and
323, High Holborn, London,
Patent Agents for the Applicants.

LONDON: Printed by EYRE AND SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

1885.